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AUTHOR Huang, Zheng Sen
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ABSTRACT

This report presents the results and sample items of a reading test and a mathematics test administered to Year 5 and Year 7 primary level students in 1989 in the Northern Territory of Australia. The Primary Assessment Program (PAP) monitors achievement in English and Mathematics in urban schools. All students in Years 5 and 7 are tested in reading and mathematics each year. Writing is assessed by analyses of teacher-assessed sample scripts sent in from schools. Diagnostic information and trend analysis data are extracted for use by both the school and system. A forward notes that data from 1988 and 1989 provide convincing evidence that standards are being maintained and that there was a significant improvement in the achievement of Year 7 students in mathematics. Chapter 1 describes the PAP covering the nature of the materials and reporting of results. Chapter 2 offers results of the Year 5 mathematics test. Chapter 3 details results of the Year 7 mathematics test. Chapter 4 covers results of the Year 5 reading test. Chapter 5 contains results of the Year 7 reading test. Chapter 6 summarizes the findings and provides analyses. Appendixes 1 and 2 list members of the Primary Assessment Committee and the 1989 Mathematics Test Panels. Appendix 3 contains four selections from the reading tests. (JB)

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Results of the Primary Assessment Program 1989

Huang Zheng Sen
Principal Research Officer

Northern Territory Department of Education
Darwin 1990

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For further information please contact:

Principal Research Officer
Curriculum & Assessment Branch
GPO Box 4821
Darwin NT 0801
Telephone: (089) 89 5611

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FOREWORD

At the begining of February this year, schools received the results of their own students in the system-wide testing program under confidential arrangements. The results from the Primary Assessment Program (PAP) in 1989 are very encouraging. In both reading and mathematics, performance of Year 5 and Year 7 students was very satisfactory. I am pleased to note that data from the testing program conducted in 1988 and 1989 provide convincing evidence that standards are being maintained and analysis of performance for 1988 and 1989 indicates a significant improvement in the achievement of Year 7 students in mathematics from one year to the next.

Comparison of performance between years is carried out to enable trends to be monitored. However, it should be emphasised that tests have their limitations and among these is the qualification that only some aspects of the curriculum can be tested at any point in time. Sampling of tasks is therefore very important in a testing program if the tests are to have any validity and the results any significant implications for schools.

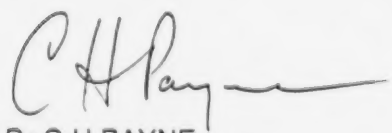
The PAP is not concerned only with the basic skills, sometimes referred to as 'minimum competency' testing. The reading for different purposes test, though, belongs to this category but the new tests now being developed within this group will also tap higher level skills. In 1989, quite a high proportion of students in Years 5 and 7 found the reading comprehension tests based on selected prose passages fairly difficult. In mathematics, many found certain aspects of number, measurement and space quite difficult. These areas are highlighted in the report.

Each question in the PAP is keyed to an instructional objective (or a syllabus entry) and performance on the item gives an indication of performance on the objective. In that regard, the PAP is criterion-referenced even though the results may be interpreted in a norm-referenced fashion.

All principals and teachers in Years 5 and 7 are urged to read and consider the findings from the 1989 program. Many teachers would tend to agree that the results, in general, are consistent with their own estimation.

The possibilities for use of the tests in developing and implementing Action Plans for School Improvement are obvious. It is also extremely pleasing to see how many schools are now making good use internally of the tests as an integral part of their arrangements for curriculum implementation.

I would like to take this opportunity to thank principals and staff for the tremendous co-operation and support that they have given to the program to date. My thanks also go to the Primary Assessment Committee for their continued support and guidance and to all individual members of the test writing panels for their valuable contributions. Without so much voluntary effort complementing our limited resources we could not have achieved what we have in this area.



Dr C H PAYNE
Chairman
NT Board of Studies

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CHAPTER ONE

THE NORTHERN TERRITORY PRIMARY ASSESSMENT PROGRAM

SUMMARY

The Primary Assessment Program (PAP) monitors achievement in English and Mathematics at Years 5 and 7 in urban schools. All students in Years 5 and 7 are tested in reading and mathematics each year. Writing is assessed by moderation of teacher-assessed sample scripts sent in from schools. Each school receives results of its own students and the Territory results. Diagnostic information is extracted for use by both the school and system. Analysis of performance between administrations is carried out to examine trends. A similar program operates in Aboriginal schools. The essential difference is that the urban program measures achievement on the total curriculum whereas the Aboriginal program measures achievement on the core objectives.

INTRODUCTION

The origin of the NT Primary Assessment Program (PAP) dates back to 1982 when the release of results of NT students in a national testing program (Australian Studies in Student Performance Project) triggered a vigorous public debate on standards. A system-wide testing program on the basic skills was introduced in urban schools for Years 5 and 7 in 1983. Until 1988, the tests in reading and mathematics were based on the core objectives defined for these year levels. The shift in focus from assessment of performance on the core objectives to assessment on the total curriculum in English and Mathematics was a significant turning point in the history of the program.

Prior to 1988, the assessment of achievement was based on minimum competencies (core objectives) for reading and mathematics in Years 5 and 7. As the minimum competencies were pitched at relatively low levels, the majority of students 'passed' the tests in which the passing scores were 70% correct for reading and 80% correct for mathematics. It was not surprising that generally students did not find the tests challenging enough and many did not take them

seriously. Teachers did not find the tests very helpful. Except for identifying children at the bottom 20% of the scale, the program did not appear to have a useful purpose.

A similar system-wide assessment program was introduced in Aboriginal schools in 1986. A major distinction between the urban and Aboriginal programs is that the test contents in reading and mathematics for the latter are based on the core objectives defined for Years 4/5. The testing program for Aboriginal schools is based on minimum competencies expected of students in Year 5.

The tests for the Aboriginal program are written by teachers and staff who have taught in Aboriginal schools and the materials produced have meaning and relevance for Aboriginal children. A lot of care is taken to remove elements in the tests that appear to be culture-biased. However, it is generally recognised that no achievement test that measures learning is absolutely culture-free and there is some argument as to whether a test can or should be.

The tests in reading and mathematics for urban and Aboriginal schools are administered annually. Students' answer sheets are returned to the Curriculum and Assessment Branch for processing and analysis and results are issued to individual schools by confidential arrangements. A public report giving the Territory results is published but it does not contain results of individual schools.

NATURE OF THE MATERIALS

The writing moderation exercise is conducted in urban and Aboriginal schools once every two years. Schools are asked to return samples of students' writing from two genres, e.g. argument and explanation in accordance with procedures outlined in advance. The samples are examined by a team of experienced teachers and graded as showing 'high', 'medium' or 'low' competence. The results are produced in a booklet which contains a checklist of 'descriptors' for assessing quality in key aspects of writing and includes samples of students' work showing grades and annotated comments.

There are three types of reading comprehension tests: a series of multiple-choice tests based on selected prose passages, a series of multiple-choice tests on basic or functional literacy and a series of retelling exercises. The first type is fairly demanding. The passages are taken from texts recommended for reading at the respective year levels; the tests measure both literal and inferential comprehension and several questions appear to test high ability skills.

The second type of reading test is based on materials likely to be encountered frequently, e.g. an advertisement in a newspaper, a guide on walking tracks at a popular tourist destination (e.g. Katherine Gorge Walking Tracks), etc. These tests are intended to measure basic or functional literacy.

In the third type of reading test, students are presented with a passage of the text and a retelling of the passage in different words. The retelling of the passage contains gaps corresponding to details in the original text. Students are required to complete the retelling by filling in the gaps in one or more of their own words.

The reading tests are not timed. Teachers are asked to allow sufficient time for students to complete each test. The duration of testing ranges from 15 minutes to 30 minutes depending on the test.

The mathematics tests for Years 5 and 7 in urban schools, like the reading tests, are based on the total curriculum. Each test takes an hour and a half to complete. Questions are set in both open-ended and multiple-choice format.

The tests in mathematics include tasks covering these areas: space, measurement, number, number relations and statistics/graphs. Within each of the areas, students are presented with tasks which require them to recall basic facts, compute algorithms, use various concepts and mathematical ideas and apply them in solving problems.

For generating items, a test specifications chart is employed. The chart provides the mechanism for checking the number of items produced for each content area and for each type of ability or skill involved. It is worth noting that more than half the number of items in the mathematics tests measure understanding and application of concepts. Only a few questions measure recall.

Prior to assembling the final forms, the questions are field-trialled in a sample of schools and subjected to an item analysis to improve their quality. Each question is checked for relevance to the content area; indices of difficulty, discrimination and reliability are calculated based on traditional test theory. Some items are discarded without any further work done on them; many require some modification in the text or graphics or both. The various procedures employed in the item analysis are designed to ensure that the tests are valid in terms of their relevance to the syllabus content and classroom instruction, that they are reliable and that they discriminate well between students who are able and those less able.

As outlined below, the results of Northern Territory students on the tests are reported and sent back to schools after the completion of the program each year. A significant spin-off from the testing program is the availability of data regarding performance on questions. For each item, information is available regarding what the item measures and what proportion of Territory students has answered it correctly. These data are useful for reference when teachers administer the same tests to other groups of students or assemble their own tests by selecting items from the collection.

In addition to the tests employed in the annual testing program, schools have been provided with subpools of practice items in mathematics. Each question has been classified in terms of the specific syllabus entry, skill or ability involved and its difficulty.

REPORTING OF RESULTS

Every year by confidential arrangements, each school receives the results of its own students as well as the Territory results on each test. At the same time, students' answer scripts which were sent in for data input and analysis are returned to the school.

Three types of statistical reports are generated for the school and the system which show (1) percentage correct on each question, (2) distribution of test scores and (3) means and standard deviations for subtests.

An analysis is done to compare performance between administrations. This is carried out by using 'link' items as in mathematics, or repeating the same tests as in reading.

Report No 1: Percentage Correct on Each Item

This report gives data showing percentages of students answering each question correctly for the school and Territory cohorts respectively. Below is an example.

Test:	Mathematics Test 1989
Year Level:	Year 7
Number of items:	60
Number of students:	1797

Item Number	Percent Correct	
	School 'X'	NT
7	90.15	87.59
:	:	:
54	09.54	04.43

For the sake of convenience, the items are ranked in order of their difficulty for Territory students. The report has been found to be particularly useful in identifying areas of strength and weakness within the cohorts.

Report No 2: Distribution of Test Scores

This report shows the raw scores and percentages obtained by individual students on each test in a particular school. The distribution of scores for Territory students is also provided for each of the tests. The report enables a student's status in relation to the Territory population to be readily determined on any test.

Report No 3: Means for Subtests

In this report, the means and standard deviations for subtests are generated for both the school and Territory cohorts allowing comparisons to be made. The report enables the school and the system to identify specific areas in the curriculum which may need further attention.

The program is oversighted by the Primary Assessment Committee of the Board of Studies. Changes to the Primary Assessment Program are continually being made in response to recommendations and suggestions received from principals and teachers. The program has won wide acceptance and recognition in NT schools in recent years and has been endorsed as a project of national significance by the Australasian Cooperative Assessment Program (ACAP), a national committee sponsored by the Conference of Directors-General.

CHAPTER TWO

RESULTS ON THE MATHEMATICS TEST YEAR 5

SUMMARY

It was the first year in which Year 5 students in urban schools took a system-wide test based on the Board Approved Curriculum i.e. WA Mathematics Syllabus, Stage 5. Prior to 1989, the tests were set on the core objectives for Year 5, equivalent to Stages 3/4 in the WA Syllabus. The shift in focus of the test content to the total curriculum should enhance its instructional relevance and content validity. In Year 7, a test based on the WA Syllabus, Stage 7 has been used since 1988.

The test on the whole did not appear to be easy. Items found to be moderately difficult or very difficult were spread across various areas. Tasks particularly difficult were those involving division, fractions, conversion of metric units, time interval, rates and geometry.

MEANS ON SUBTESTS

There were 60 items covering the following strands: number, number relations, measurement, space and graphs/statistics. The distribution of items in the various areas was decided by the test writing panel at the time of test construction.

As could be expected, a large variability in individual scores was observed as evident by the size of the standard deviation.

Overall mean	=	28.91
Standard deviation	=	12.38

Table 1 shows the means and standard deviations for the subtests and total test.

SUBTEST	NUMBER OF ITEMS	MEANS	STANDARD DEVIATIONS
Number	16	7.08	4.03
Number relations	14	6.27	3.58
Measurement	16	8.47	3.47
Space	10	5.45	2.23
Graphs/Statistics	4	1.65	0.96
Total Test	60	28.91	12.38
Number of Students	1865		

Table 1 : Means on Subtests for Mathematics:Year 5

DISTRIBUTION OF SCORES

A total of 1865 students took the test. As shown in Table 2, 30.6% of students obtained scores in the range 21 - 30. The majority of students (55.9%) scored between 21 and 40. It is of interest to note that the highest score was 55 (2 students) and the lowest score was 0 (6 students). It seems that there were several items which challenged the most able students.

SCORE RANGE	NUMBER OF STUDENTS	PERCENTAGE OF STUDENTS
0 - 10	130	6.97
11 - 20	353	18.93
21 - 30	571	30.61
31 - 40	472	25.31
41 - 50	303	16.25
51 - 60	36	1.93
Total	1 865	100.00

Table 2 : Distribution of Scores for Mathematics Year 5

PERFORMANCE ON INDIVIDUAL ITEMS

As a matter of convenience, the results on individual items have been grouped into three categories to give some idea of the difficulty of questions. In this report, only some sample items have been reproduced for inspection by the reader. The categories of difficulty are as follows:

(1) items answered correctly by 65 - 100% of students
(2) items answered correctly by 40 - 64% of students
(3) items answered correctly by less than 40% of students

Table 3 gives the number of items in each category of difficulty.

% ANSWERED CORRECTLY	DIFFICULTY	NUMBER OF ITEMS
65 - 100%	Easy	15
40 - 64%	Moderate	23
< 40%	Hard	22
	Total	60

Table 3 : Difficulty of Items for Mathematics Year 5

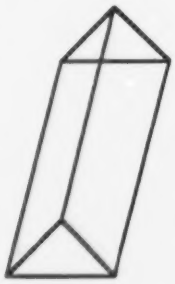
Data from Table 3 show that the majority of items fell into the categories of moderate or difficult items. From an inspection of individual questions, it appears that most students were successful on items requiring little or no calculations. Of particular interest was item 53 in which nearly 70% of students were successful on an apparently difficult concept.

Three sample items in the first category are reproduced here.

EASY ITEMS

Item 23

How many faces does this figure have?

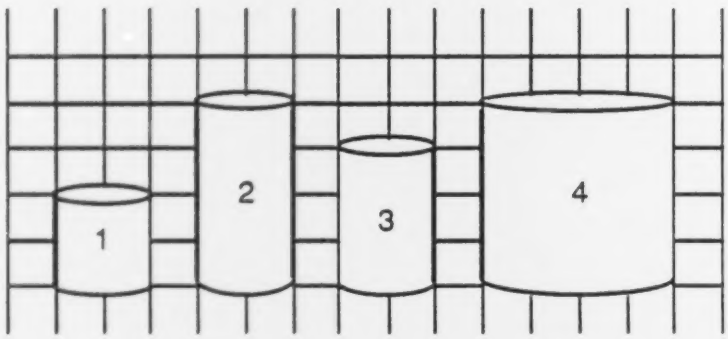


Answer:_____5_____

Percent correct = 76.89

Item 53

Which cylinder would hold exactly twice as much as cylinder 1?

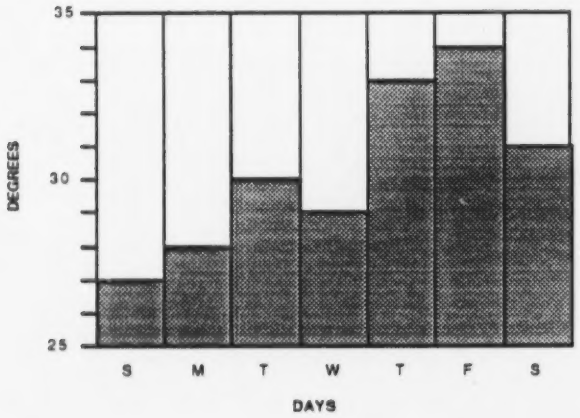


Answer:_____2_____

Percent correct = 67.72

Item 56

TEMPERATURES DURING A WEEK



What was the second highest temperature for the week?

Answer:_____33_____degrees

Percent correct = 65.95

Items found to be moderately difficult included subtraction, multiplication and division tasks, fractions, decimals, conversion with units, time lapse and rates. The following examples illustrate these.

MODERATELY DIFFICULT ITEMS

Item 4

$$\begin{array}{r} 1016 \\ -\ \ 92 \\ \hline 924 \end{array}$$

Percent correct = 62.79

Item 2

$$5\overline{)\,845}\quad 169$$

Percent correct = 62.63

Item 34

$$\begin{array}{r} 637 \\ \times \quad 7 \\ \hline 4459 \end{array}$$

Percent correct = 62.36

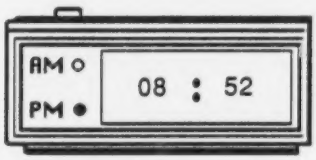
Item 20

2.04 m = _____204_____ cm

Percent correct = 61.18

Item 49

What time will it be in 19 minutes?



Answer:_____9.11_____p.m.

Percent correct = 55.9

Item 43

Mark with a cross (X) the largest number.

~~$\frac{1}{2}$~~ $\frac{1}{5}$ $\frac{3}{10}$

Percent correct = 48.20

Item 7

A bricklayer laid 774 bricks in 9 hours. At this rate how many bricks did he lay in one hour?

Answer:_____86_____

Percent correct = 41.98

Item 42

Write these numbers from smallest to largest.

0.007; 7.00; 70.1; 7.01; 0.701;

Answer:__0.007__0.701___7.00___7.01____70.1_____

Percent correct = 41.29

The last category included items involving more complex calculations or more difficult concepts. A few examples are reproduced below.

HARD ITEMS

Item 33

I bought 8 boxes of fruit juice at 55¢ each. How much change did I get from $10?

Answer:_____$ 5.60_____

Percent correct = 37.86

Item 40

2 m + 25 cm + 3 m + 4 cm =

Answer:_____529_____cm

Percent correct = 35.39

Item 37

1060 bricks were needed for a job. A full pallet holds 432 bricks. 3 pallets were delivered. Two were full.

How many bricks were on the pallet that was not full?

Answer:_____196_____

Percent correct = 25.47

Item 13

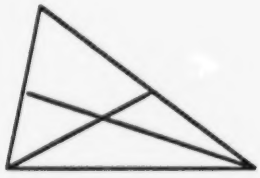
List the square numbers less than 10

Answer:_____1, 4, 9_____

Percent correct = 12.01

Item 47

How many triangles are there in this figure?



Answer:_____8_____

Percent correct = 6.60

Since the tests in 1988 were restricted to the core objectives, and since no items from the 1988 testing program had been included in 1989, it was not possible to determine changes in performance between the two years.

CHAPTER THREE

RESULTS ON THE MATHEMATICS TEST YEAR 7

SUMMARY

In the 60-item test based on the total curriculum, the majority of students (53.5%) scored between 21 and 40. Most succeeded in tasks on the four operations involving whole numbers. Slightly more than half the number of items in the test were answered correctly by 40 - 64% of students and these included questions on fractions, decimals, percentages, angles in a triangle, 3-dimensional geometry, transformations and time intervals. Problem-solving tasks and geometry (angles) posed the greatest difficulty for students.

Analysis of results on the 'link' items i.e. items common to both 1988 and 1989 administrations showed that performance in 1989 appeared to be significantly better than that in 1988.

MEANS ON SUBTESTS

The Year 7 test comprised 60 items measuring important concepts in the Year 7 syllabus. A total of 1797 students took the test. Table 4 below gives the means and standard deviations for the subtests and total test.

Subtest	Number of Items	Means	Standard Deviations
Number	12	7.43	2.75
Number relations	12	6.18	2.93
Measurement	18	8.05	4.03
Space	12	5.59	2.67
Graphs/Statistics	6	3.15	1.65
Total Test	60	30.39	12.05
Number of Students =	1797		

Table 4 : Means on Subtests for Mathematics Year 7

A mean of 30.39 for the total test suggested that it was neither an easy nor a difficult test but variations between individual scores were quite large as evident from the size of the standard deviation.

DISTRIBUTION OF SCORES

From the frequency distribution a table was constructed which shows the number of students falling within the range of scores indicated (Table 5).

Score Range	Number of Students	Percentage of Students
0 - 10	55	3.06
11 - 20	373	20.76
21 - 30	526	29.27
31 - 40	435	24.21
41 - 50	313	17.41
51 - 60	95	5.29
Total	1797	100.00

Table 5 : Distribution of Scores for Mathematics Year 7

The majority of students (53.5%) scored in the range 21 - 40. 23.8% had scores of 20 or below; 22.7% scored higher than 40 in the 60-item test.

PERFORMANCE ON INDIVIDUAL ITEMS

Table 6 provides at a glance the number of questions found to be easy, moderate or hard on the test. Items were classified as easy where 65 - 100% of students got the correct answer. Items were considered moderately difficult where 40 - 64% had the correct answer and they were hard where less than 40% got the answer right.

% ANSWERED CORRECTLY	DIFFICULTY	NUMBER OF ITEMS
65 - 100%	Easy	14
40 - 64%	Medium	32
< 40%	Hard	14

Table 6 : Difficulty of Items for Mathematics Year 7

As can be seen from Table 6, there were equal numbers of items emerging as easy or hard but the majority of questions appeared to be of medium difficulty.

An item by item analysis shows that high proportions achieved success in addition, subtraction, multiplication and division tasks with whole numbers and word problems of a simple type involving the basic operations. Interpreting a column graph was easy for most students. Three examples in the first category of items found easy are reproduced below.

EASY ITEMS

Item 7

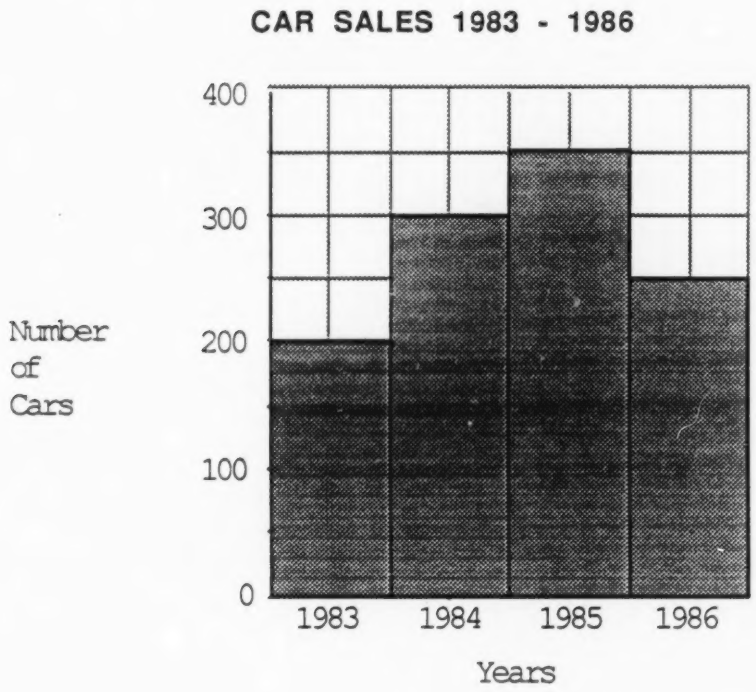
For every $10 Mum spends at the shop she gets 4 free stamps.
How many would she get after she has spent $80?

A. 4 B. 8

C. 20 D. 32

Percent correct = 87.59

Item 30



How many more cars were sold in 1984 than 1983?

Answer : _____100_____

Percent correct = 86.87

Item 50

A journey by car takes 2 h 15 min at an average speed of 60 km/h. What is the distance of the journey?

A. 120 km B. 135 km

C. 275 km D. 1 020 km

Percent correct = 67.28

Questions found to be moderately difficult included fractions and decimals, percentages, angles in a triangle, 3-dimensional geometry, linear transformation and time lapse. As the largest number of items fell into this category, six items have been reproduced.

MODERATELY DIFFICULT ITEMS

Item 41

In a skateboard club there are 350 children. There are 70 more girls than boys. What percentage of children are girls?

A. 20%

B. 40%

* C. 60%

D. 50%

Percent correct = 64.39

Item 51

A rectangular prism has a volume of 24 cm^3, a length of 4 cm, and a width of 3 cm. What is its height?

A. 1 cm

* B. 2 cm

C. 3 cm

D. 4 cm

Percent correct = 61.49

Item 19

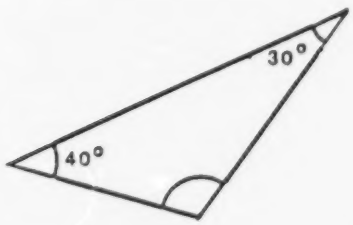
How many extra hours of shopping are possible on Thursday than on Friday at this shop?

Answer : _____$3\frac{1}{2}$_____ hours

Percent correct = 58.49

Item 13

Calculate the size of the third angle in the triangle?



Answer : _____110_____ degrees

Percent correct = 58.15

Item 37

Arrange the following from smallest to largest

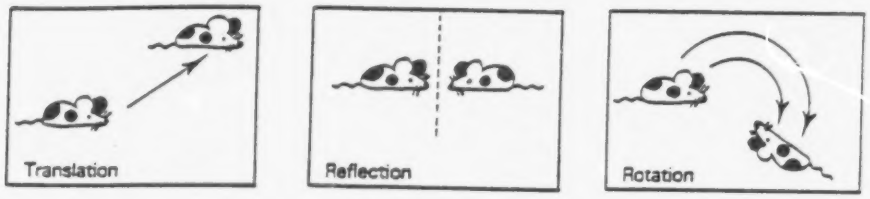
$\frac{2}{5}$, 0.45, 44%

Answer : ___$\frac{2}{5}$ __44%___0.45_____

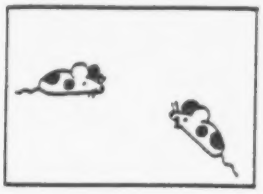
Percent correct = 48.25

Item 48

The diagrams show three types of movement called translation, reflection and rotation.



What movements have occurred in the diagram below?



A. a rotation only

B. a rotation and a translation

C. a reflection and a translation

D. a reflection and a rotation

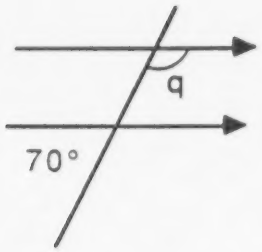
Percent correct = 47.30

The tasks that posed the greatest difficulty were of a mixed kind. They included word problems requiring more mathematical reasoning, geometry and calculating the perimeter of more complicated shapes.

HARD ITEMS

Item 44

What is the size of angle q?



Answer : ___110°_____ degrees

Percent correct = 34.50

Item 42

A frog takes 6 jumps to reach the end of a line.

A boy takes 4 jumps.

How many boy's jumps would cover the same distance as 9 frog jumps?

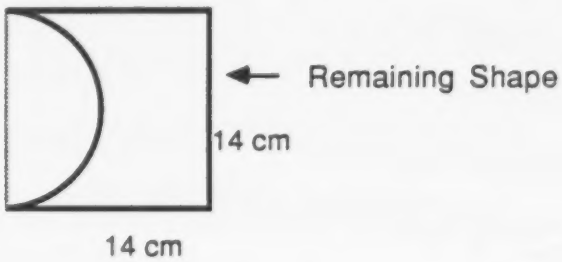
Answer : _____6_____

Percent correct = 32.28

Item 57

A semi-circle is cut from a square with sides 14 cm long.
Calculate the perimeter of the new figure.
[Use perimeter of circle, $P=2\pi r$]

(Take π as $\frac{22}{7}$)



Answer : _____64_____ cm

Percent correct = 5.12

COMPARISON BETWEEN 1988 AND 1989 PERFORMANCE

A comparison was made between performance in 1988 and 1989 based on items common to both administrations. No comparison was possible with performance in earlier years because the testing program was radically changed in 1988 to test achievement beyond the core objectives.

The analysis used was a t-test between means for correlated data. This test of significance considered data from individual items, using percentage correct values. It is a more sensitive test than the t-test between means as it uses data from all items. The t-test of significance for correlated means was applied to 15 'link' items.

Table 7 shows the results on the link items for 1988 and 1989.

ITEM NO (as in 1989)	PROPORTION CORRECT 1988	1989
2	0.56	0.63
8	0.58	0.68
13	0.48	0.58
17	0.36	0.40
22	0.42	0.56
26	0.33	0.40
29	0.63	0.68
30	0.84	0.87
36	0.55	0.63
37	0.43	0.48
38	0.61	0.66
46	0.37	0.43
50	0.59	0.67
57	0.04	0.05
60	0.25	0.25
MEANS	0.47	0.53
STD DEVIATION	0.19	0.20
CORRELATION BETWEEN 1988 AND 1989	0.99	
NUMBER OF STUDENTS	1836	1797

Table 7 : Comparison Between 1988 and 1989 Performance

Calculations performed on the link items indicate that performance in 1989 appeared to be significantly better than that in 1988.

CHAPTER FOUR

RESULTS ON THE READING TESTS YEAR 5

SUMMARY

A major revision was carried out in 1988 on the reading tests to correct ambiguities in the questions and to streamline the test length. This exercise which involved alterations to several questions made it untenable to compare results from 1988 and 1989 with those of previous years. Even if the same tests are repeated and no items have been changed, as in the case for 1988 and 1989, there are limitations to how the results may be interpreted. A comparison of performance between 1988 and 1989 can be justified with the limitations of the tests themselves in mind. The tests were multiple-choice and they measured only some aspects of reading ability, i.e. extracting literal and inferential meaning from a given prose passage.

TESTS ADMINISTERED

In 1989 each school was asked to administer one reading comprehension multiple-choice (MC) test based on a given passage and one retelling test from the TORCH series. (TORCH: Tests of Reading Comprehension published by ACER). The retelling test was introduced for the first time in Year 5. In the retelling test, students were presented with a passage and a retelling of the passage in different words. The retelling contained gaps which students were required to complete by filling the gaps with one or more of their own words. The multiple-choice tests required students to extract literal and inferential meaning from a given prose passage.

All schools did the same TORCH test. Using a sampling procedure employed in previous years, four reading comprehension tests (multiple-choice) were administered throughout the system but each school had to do only one of the tests. Sampling resulted in four groups of schools, each group comparable to each other and representative of the Territory student population in the cohort.

MEANS ON TESTS

The table below shows the means and standard deviations obtained on the reading tests given to Year 5 students.

Test (code)	No. of Items	Means	Std Deviations	No. of Students
Reading comp (C4)	10	7.64	2.00	481
Reading comp (C5)	10	6.93	2.27	421
Reading comp (C6)	10	7.98	2.22	430
Reading comp (C7)	10	6.04	2.51	480
Reading com (TOR)	22	15.29	6.34	1819

Table 8 : Means on Reading Tests for Year 5

COMPARISON BETWEEN YEARS

A major revision on the reading tests carried out in 1988 made it untenable to compare the results for 1988 and 1989 with those in 1987 or earlier. An analysis of the results for 1988 and 1989 was carried out. Table 9 below gives the means and standard deviations obtained in 1988 and 1989 on each test for comparison.

	1988	1989	Significance of Difference between Means
Test C4:			
Mean	6.82	7.64	Significant
Std Deviation	1.98	2.01	$p < 0.05$
Test C5:			
Mean	6.84	6.93	Not Significant
Std Deviation	2.21	2.27	$p > 0.05$
Test C6:			
Mean	7.47	7.91	Significant
Std Deviation	2.56	2.24	$p < 0.05$
Test C7:			
Mean	6.71	6.02	Significant
Std Deviation	2.85	2.50	$p < 0.05$

Table 9 : Comparison Between 1988 and 1989 Results on the Reading Tests

A t-test between means shows that on two tests namely C4 and C6, the results for 1989 were significantly higher than those for 1988.

On one of the tests, namely, C7 the 1989 mean was significantly lower but on the fourth test, C5, the difference between 1988 and 1989 means was not statistically significant. From the data , it would be difficult to conclude that performance in reading comprehension in one year was significantly higher than that in the other. There was no evidence to suggest that performance on the whole had declined.

For the interest of the reader, one of the tests has been reproduced in the Appendixes to give some idea of the tasks that students were required to do.

CHAPTER FIVE

RESULTS ON THE READING TESTS YEAR 7

SUMMARY

In 1988, the reading tests used in the program were revised to correct certain ambiguities in the questions and to streamline test length. Alterations to several questions and changes to the number of questions from the original tests meant that results from 1988 and 1989 could not be compared with those of previous years with reasonable accuracy. Even if the same tests are repeated and no items have been changed, as in the case for 1988 and 1989, there are limitations to how the results may be interpreted. A comparison of performance between 1988 and 1989 can be justified with the limitations of the tests themselves in mind. The tests were multiple-choice and they measured only some aspects of reading ability, i.e. literal and inferential comprehension.

TESTS ADMINISTERED

In 1989 each school administered three different tests, namely, a multiple-choice (MC) test based on a given passage, a MC test on reading for different purposes based on materials frequently encountered and a retelling test from the TORCH series (TORCH : Tests of Reading Comprehension published by ACER).

All schools did the same TORCH test. Using a sampling process employed in previous years, four reading comprehension tests and four tests on reading for different purposes were administered throughout the system although each school had to do only one from each category.

Three of the tests, one from each group, have been reproduced in the Appendixes for the interest of some readers.

READING COMPREHENSION

The comprehension tests were set on passages selected from materials that were normally encountered in the classroom. Their readability levels had been carefully considered for their suitability by the panel of teachers who had the task of developing the tests. The objectives measured included both literal and inferential comprehension, as listed below.

Literal Comprehension

Identify main idea
Arrange events in sequence
Locate specific details and facts
Give meaning of words in context

Inferential Comprehension

Infer from facts given
Draw a conclusion
Identify character traits
Determine cause of event

READING FOR DIFFERENT PURPOSES

The group of tests in reading for different purposes included various reading materials on which questions were asked. The tests measured the following main skills:

Locating information
Following directions
Using library reference skills
Interpreting information from various sources.

TORCH TEST

In the Torch test, students were presented with a passage of text and a retelling of the passage in different words. The retelling of the passage contained gaps corresponding to details in the original text. Students were required to complete the retelling by filling in the gaps using one or more of their own words.

The exercise component (i.e. the retelling) of the test resembled a cloze passage where words had been deleted from a piece of text. In the TORCH tests, however, the deletions, or spaces, in the exercise represented the focus of the questioning. Each of the spaces was an attempt to get students to answer a question identified as being important to demonstrate comprehension. A context was given to cue readers into the sorts of answers they should give.

MEANS ON READING TESTS

The table below gives the means and standard deviations obtained on the reading tests given to Year 7 students.

Test	(code)	No of items	Means	Std Deviations	No of Students
Reading Comp	(C3)	15	9.94	3.29	439
Reading Comp	(C4)	15	10.89	2.76	454
Reading Comp	(C5)	15	11.82	2.86	445
Reading Comp	(C8)	15	9.93	2.86	389
RDP	(R1)	12	0.45	1.91	408
RDP	(R2)	2	9.97	1.92	449
RDP	(R9)	5	13.07	2.40	440
RDP	(R12)	12	10.07	1.79	461
Reading Comp	(TOR)	22	13.16	5.67	1740

(RDP: Reading for Different Purposes)

Table 10 : Means on Reading Tests for Year 7

Students found the tests on reading for different purposes easier than the reading comprehension tests based on passages. This was to be expected as the material presented for reading comprehension was more difficult. The material in reading for different purposes was factual and questions asked were those requiring students to locate information, follow directions or extract information.

COMPARISON BETWEEN 1988 AND 1989

Two of the tests administered in 1989 allowed comparison of performance to be made between 1988 and 1989, viz. C3 and C5. Both were reading comprehension tests based on passages. Alterations to questions on the other two comprehension tests, C4 and C8, and changes to their length in 1989 posed problems for comparison of results between 1988 and 1989. In 1988, no reading for different purposes test was given to Year 7 students, hence it was not possible to find out if there were any changes in performance on these tests.

Table 11 below gives the results for 1988 and 1989 on the two reading comprehension tests.

		1988	1989	Significance of Difference between Means
Reading Comp (Test C3)	Mean	9.31	9.94	Sig
	Std Deviation	3.88	3.29	$p<0.05$
Reading Comp (Test C5)	Mean	10.60	11.82	Sig
	Std Deviation	3.38	2.86	$p<0.05$

Table 11 : Comparison Between 1988 and 1989 on the Reading Testt

A t-test between means shows that on the two tests, C3 and C5, the results for 1989 were significantly higher than those for 1988.

CHAPTER SIX

SUMMARY AND CONCLUSION

The PAP measures achievement in English and Mathematics at Years 5 and 7 in urban schools at the system level. Aspects of reading comprehension, viz. literal and inferential comprehension are measured by written tests and children's writing by a procedure of moderating sample students' scripts. Tests are used to measure achievement in mathematics. This report deals with results from the tests administered in 1989 in reading and mathematics.

In 1989, students in Year 5 took for the first time a mathematics test based on the whole syllabus for Year 5. Prior to 1989, the tests were set on the 'core objectives', roughly equivalent to the syllabuses covered in Years 3/4. The shift in test content followed a similar change that took place in Year 7 the previous year.

In the first year of testing at Year 5 based on an expanded syllabus, the results on the 60-item test showed that students seemed to have difficulty in various areas. The tasks found difficult were those involving division, fractions, conversion of metric units, time intervals and rates. Most had no trouble with addition, subtraction, multiplication and division tasks involving whole numbers, reading time, identifying least areas or largest volume and naming two-dimensional shapes. Many had difficulty in addition and subtraction of fractions and decimals, or converting units of length and mass which require an understanding of decimal numbers.

It was not possible to find out whether there was any change in performance between 1988 and 1989 because the test administered in 1988, based on the core objectives, was completely different from that used in 1989 based on the total curriculum. However, this will be possible with the tests administered in future.

On the 60-item test in mathematics at Year 7, slightly more than half of the cohort scored between 21 and 40. A high proportion succeeded in the addition, subtraction, multiplication and division tasks involving whole numbers. Most did well in word problem tasks where the computations were straightforward. Questions found to be moderately difficult included fractions and decimals, percentages, angles in a triangle, 3-dimensional geometry, linear transformation and time intervals. Tasks found most difficult included those in simultaneously converting length units and ordering, geometry of angles and measurement of perimeter.

An analysis of performance on the link items, i.e. common items used in 1988 and 1989 showed that students in Year 7 appeared to have done significantly better in 1989. This was a very encouraging result.

Reading comprehension was measured by three different kinds of tests. The first type was a test in literal and inferential comprehension based on a prose passage. The second type was based on common everyday materials e.g. a shop advertisement, telephone directory. The third was a retelling test from the TORCH series published by the Australian Council for Educational Research.

Generally, students in Years 5 and 7 have performed satisfactorily as shown by the test means and standard deviations. At Year 5, where it was possible to compare performance between 1988 and 1989 on the results of four comprehension tests, it was shown that on two of the tests, the cohort in 1989 did significantly better than the cohort in 1988. On the third test, the 1989 cohort did significantly worse but on the fourth, the difference was not statistically significant. There was no evidence of a decline in performance on reading comprehension.

At Year 7, alterations to the reading test questions and changes to test length on several of the tests used in the program posed problems for comparison of results between 1988 and 1989. However, it was possible to examine changes in performance on two of the comprehension tests. Test data from 1988 and 1989 suggest that performance in 1989 was significantly higher.

A question-by-question analysis is perhaps the most beneficial way of examining the results as it gives more detailed information on performance by a class of pupils, particularly, if this is done together with information on the proportion of Territory students who have answered each question correctly. There does not seem to be much point in analysing separately performance in literal comprehension and inferential comprehension because one cannot teach these separately. For those interested to know the nature of the reading tests, some of these have been reproduced in the Appendix.

The program had a controversial beginning. It was initiated by the NT government in response to a public outcry about standards triggered by a report published in 1982 which revealed that NT 10-year-old and 14-year-old students had performed poorly in the national testing program. A system-wide testing program for Years 5 and 7 was launched in 1983 to monitor standards on the basic skills. It was then left to the Working Party established by the then Minister for Education, and the test development team to devise a testing program. The Working Party recommended an assessment package comprising a series of tests for reading and mathematics, moderation of students' writing and a checklist of practical strategies for assessment of reading such as library reference skills, which could not be validly evaluated using written tests. The development and implementation of the package was a mammoth task, but the tasks were completed in a record time of ten months. The rest is history.

On hindsight, the Working Party is to be credited for its conception of an assessment package that appears to be sound and balanced. The Primary Assessment Committee of the NT Board of Studies which took over the functions of the Working Party in 1985 oversees the program and maintains a vital communication link between the system and schools.

Each year more and more teachers offer their expertise and services to work on the test development side. School participation rates have increased substantially; for the urban program the participation rate in 1989 was 100%. The PAP results are being used increasingly by schools to complement other school-based assessment measures.

The results of individual schools are confidential and are returned to the schools to be analysed and interpreted at the school level. There is a real danger of misinterpretation and of the harm which this can cause if individual school results are made public. Even though results of individual schools are not compared, schools are free to make use of their own results. It is necessary to caution that if school results are published by the school council, this should take place only in the context of reports about the school as a whole. The report should be fair to the work done by the school and take account so far as possible of socio-economic and other influences that may affect results.

Future directions could well lie in the field of test development and reporting. Instructional relevance and content validity of tests are key to any meaningful use and interpretation of test scores. Test materials should match curriculum objectives closely to achieve these. Students are likely to warm towards tests that reveal what they can do and at the same time are interesting to work through. This calls for imagination and creativity in test generation. Analysis and reporting will continue to remain the province of the measurement specialist but if use is going to be made of the reports, they must be simple to understand and easy to use. The Primary Assessment Program results should never be used in isolation but in conjunction with other assessment strategies devised by the classroom teacher. The quality of materials produced is very much dependent upon the creative talent, imagination and expectations of the teaching staff who now contribute practically all the items that finally appear in the tests.

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APPENDIX I

NT Board of Studies - Primary Assessment Committee

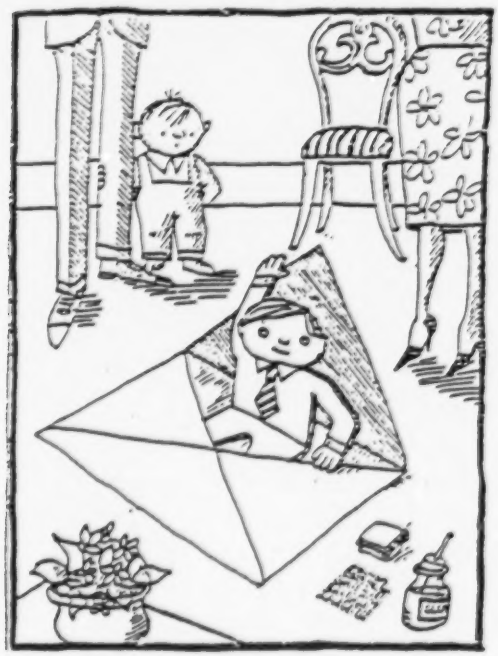
Mr Cliff Fowler	(Chair)	*Superintendent - ERA*
Mr Ron Abbott		*Principal - Millner Primary School*
Mr Nick Cockshutt		*Superintendent - Curriculum*
Mr Huang Zheng Sen		*Principal Research Officer*
Mr Mick Myers		*Principal - Moil Primary School*
Ms Sue Murphy		*(Executive Officer)*

Mathematics Test Panel Year 5 1989

Ms Elizabeth Gammon		*Jingili Primary School*
Mr Geoffrey Gillman		*Sacred Heart Primary School*
Ms Ilona Gogniat		*Millner Primary School*
Mr Huang Zheng Sen	(Convenor)	*Curriculum and Assessment Branch*
Mr John Hubbard		*Nakara Primary School*
Ms Anne Mauger		*Parap Primary School*
Ms Lorraine McGuire		*Anula Primary School*
Mr Peter McPhee		*Anula Primary School*
Ms Sue Murphy		*Curriculum and Assessment Branch*
Mr Robert Taylor		*Moulden Park Primary School*

Mathematics Test Panel Year 7 1989

Ms Lisa Bacskai		*Jingili Primary School*
Ms Ros Campbell		*St John's College*
Ms Barbara Clarke		*Parap Primary School*
Ms Sally Clarke		*Darwin High School*
Mr Huang Zheng Sen	(Convenor)	*Curriculum and Assessment Branch*
Ms Debbie Lee		*Nightcliff High School*
Ms Sue Murphy		*Curriculum and Assessment Branch*
Ms Helen Pearce		*Stuart Park Primary School*
Mr Noel Quek		*Millner Primary School*
Mr Robert Taylor		*Moulden Park Primary School*



One morning Stanley, a normal, healthy, little boy, awoke to find himself as flat as a pancake! During the night an enormous bulletin board had fallen on top of him and this resulted in his new shape. Stanley, still perfectly fit and healthy, finds that there are certain advantages to being flat such as being able to slide under closed doors and between the bars of gratings. What follows is another of Stanley's adventures.

1. One day Stanley got a letter from his friend Thomas Anthony Jeffrey, whose family had moved recently to California. A school holiday was about to begin and Stanley was invited to spend it with the Jeffreys.

   'Oh, boy!' Stanley said. 'I would love to go!'

   Mr Lambchop sighed. 'A round trip or aeroplane ticket to California is very expensive', he said. 'I shall have to think of some cheaper way.'

2. When Mr Lambchop came home from the office that evening, he brought with him an enormous brown-paper envelope.

   'Now then, Stanley', he said. 'Try this for size.'

   The envelope fitted Stanley very well. There was even room left over, Mrs Lambchop discovered, for an egg-salad sandwich

made with thin bread, and a flat cigarette case filled with milk.

3. They had to put a great many stamps on the envelope to pay for both airmail and insurance, but it was still much less expensive than a train or aeroplane ticket to California would have been.

4. The next day Mr and Mrs Lambchop slid Stanley into his envelope, along with the egg-salad sandwich and the cigarette case full of milk, and mailed him from the box on the corner. The envelope had to be folded to fit through the slot, but Stanley was a limber boy and inside the box he straightened up again.

5. Mrs Lambchop was nervous because Stanley had never been away from home alone before. She rapped on the box.

   'Can you hear me, dear?' she called. 'Are you all right?'

   Stanley's voice came quite clearly. 'I'm fine. Can I eat my sandwich now?'

   'Wait an hour. And try not to get overheated, dear', Mrs Lambchop said. Then she and Mr Lambchop cried out 'Goodbye, good-bye!' and went home.

6. Stanley had a fine time in California. When the visit was over, the Jeffreys returned him in a beautiful white envelope they had made themselves. It had red-and-blue markings to show that it was airmail, and Thomas Jeffrey had lettered it 'Valuable' and 'Fragile' and 'This End Up' on both sides.

7. Back home Stanley told his family that he had been handled so carefully he never felt a single bump. Mr Lambchop said it proved that jet planes were wonderful, and so was the Post Office Department, and that this was a great age in which to live.

   Stanley thought so too.

'Flat Stanley' - BROWN, Jeff

STUDENT QUESTION SHEET

DO NOT MARK THIS SHEET

1. This story is about the adventures of

   A the Lambchop family.

   B. an envelope.

   C. Stanley Lambchop.

   D. Thomas Jeffrey

Percent correct = 81.91

2. Why was Stanley put into an envelope?

   A. To be posted to California

   B. To slide under the door

   C. To use up spare stamps

   D. To fit into a postbox

Percent correct = 90.85

3. Stanley was an unusual boy because

   A. he went to California.

   B. his body was flat.

   C. he liked egg-salad sandwiches.

   D. he had a friend call Thomas.

Percent correct = 90.64

4. Why was Flat Stanley mailed to California in an envelope?

   A. He just fitted into an envelope.

   B. School holidays were about to begin.

   C. So he would not get damaged.

   D. It was cheaper than buying an aeroplane ticket.

Percent correct = 82.12

STUDENT QUESTION SHEET

DO NOT MARK THIS SHEET

5. Which words **best** describe Mrs Lambchop?

   A. Happy and healthy

   B. Mean with money

   C. Kind and caring

   D. Noisy and rough

Percent correct = 80.46

6. After his holiday Stanley would probably

   A. want to live in a letterbox.

   B. want to travel more.

   C. start collecting stamps.

   D. drink his milk from a cigarette case.

Percent correct = 78.38

7. In paragraph 1, the word **round** means:

   A. Like a ball

   B. A type of song

   C. Like a wheel

   D. Go there and back

Percent correct = 79.21

8. Arrange these sentences in the proper order in the spaces on your answer sheet.

   A. Stamps were stuck on the envelope.

   B. Mr and Mrs Lambchop said good-bye.

   C. The envelope was folded to fit.

   D. Stanley slid into the envelope.

Percent correct = 18.22

STUDENT QUESTION SHEET

DO NOT MARK THIS SHEET

9. A good title for this story would be

   A. Flat Stanley's Holiday

   B. The Large Envelope

   C. A Letter From Thomas

   D. How To Post A Letter

Percent correct = 80.25

10. Which of these is a fact?

   A. A person eats lunch inside a letterbox.

   B. Milk will keep in a cigarette case.

   C. Letters cost less than aeroplane tickets.

   D. A boy can travel in an envelope.

Percent correct = 84.41

END OF TEST

Miyax, an Eskimo girl, is lost on the Alaskan tundra when she meets up with a pack of wolves.

1. She stepped onto the lake and skipped towards them. Halfway across she saw a dark head rise above the hill, and a beast with a head as large as the moon rose to its hind feet, massive paws swinging.

2. Grizzly!' she gasped and stopped stone still, as the huge animal rushed onto the ice. Amaroq and Nails leapt at its face and sprang away before the bear could strike. They were heading it off, trying to prevent it from crossing. The bear snarled, lunged forward and galloped towards Miyax.

3. She ran towards her tent. The wind was in her face and she realised that she was downwind of the bear, her scent blowing right to him. She darted off in another direction, for bears have poor eyesight and cannot track if they cannot smell. Slipping and sliding, she reached the south bank as the grizzly staggered forward, then crumpled to its knees and sat down. She wondered why he was not in hibernation. The wolves had been sleeping all day - they could not have wakened the bear. She sniffed the air to try to smell the cause, but only odourless ice crystals stung her nose.

4. The pack kept harassing the sleepy beast, barking and snarling, but with no intention of killing it. They were simply trying to drive it away - away from her, she realized.

5. Slowly the bear got to its feet and permitted itself to be herded up the lake bank and back to where it had come from. Reluctantly, blindly, it staggered before the wolves. Occasionally it stood up like a giant, but mostly it roared in the agony of sleepiness.

6. Yapping, barking, darting, the wolves drove the grizzly far out on the tundra. Finally they veered away and, breaking into a joyous gallop, dashed over the snow and out of sight. Their duty done, they were running - not to hunt, not to kill - but simply for fun.

7. Miyax was trembling. She had not realized the size and ferocity of the dark bear of the North, who is called 'grizzly' inland, and 'brown bear' along the coast - Ursus arctos. Large ones, like the grizzly her wolves had driven away, weighed over five hundred kilograms and stood nearly three metres tall when they reared. Miyax wiped a bead of perspiration from her forehead. Had he come upon her tent, with one curious sweep of his paw he would have snuffed out her life while she slept.

'Amaroq, Nails, Kapu,' she called, 'I thank you. I thank you.'

'Julie of the Wolves' - GEORGE, Jean C

52

STUDENT QUESTION SHEET

DO NOT MARK THIS SHEET

1. What is the **main idea** in this passage?

   A. The wolves saved Miyax from the bear.

   B. Many bears roam the tundra.

   C. Bears hibernate in winter.

   D. Miyax enjoyed living with the wolves.

Percent correct = 85.42

2. Arrange these statements in the correct order on your answer sheet.

   A. The grizzly rushed onto the ice.

   B. Miyax ran towards her tent.

   C. The wolves attacked the bear.

   D. Miyax saw a dark head rise above the hill.

Percent correct = 32.12

3. What word best describes how Miyax felt when she first saw the bear?

   A. Curious

   B. Unconcerned

   C. Excited

   D. Terrified

Percent correct = 84.28

4. At first the wolves attacked the bear

   A. to the head.

   B. to the chest.

   C. to the feet.

   D. to the back.

Percent correct = 61.73

5. Miyax realised she was in a dangerous position because

   A. the bear was hungry.

   B. the bear could smell her scent.

   C. the wolves were annoying the animal.

   D. the bear was annoyed with the wolves for awakening it.

Percent correct = 78.36

6. What had woken the bear from his hibernation?

   A. Miyax

   B. The wolves

   C. A smell

   D. The passage does not say

Percent correct = 69.48

7. How do you know that Miyax was quick-witted?

   A. When she saw the bear she ran towards her tent.

   B. She thought the bear should have been hibernating.

   C. She ran in a different direction to escape the bear.

   D. She thanked the wolves for saving her.

Percent correct = 60.82

8. What caused the bear to leave the scene?

   A. Miyax was running away.

   B. The bear wanted to go back to sleep.

   C. The wolves were tormenting the bear.

   D. The icy crystals were stinging his face.

Percent correct = 69.02

9. Which statement **best** describes the behaviour of the wolves in this passage?

A. Wolves are cunning creatures.

B. Wolves can be loyal to a human.

C. Wolves attack lone travellers.

D. Wolves like to hunt bears.

Percent correct = 70.62

10. How do we know that wolves were protective of their mistress?

A. They drove the bear away from the camp.

B. They played games in the snow.

C. They licked Miyax's face.

D. They ran away from the camp.

Percent correct = 91.34

11. In paragraph 6 **veered** means

A. spun.

B. turned.

C. looked.

D. drove.

Percent correct = 62.19

12. Choose the statement that is an **opinion**.

A. Miyax thanked the wolves.

B. Miyax froze when she saw the bear.

C. Miyax was foolish to be travelling alone.

D. Miyax's life was saved by the wolves.

Percent correct = 55.13

13. At the end of the story Miyax felt

A. pleased that the wolves were playing the snow.

B. that she had chosen a bad place to camp.

C. that she had formed a strong bond of friendship with the wolves.

D. that it was time to go to sleep in her tent.

Percent correct = 78.13

14. The scientific name for the bear is

A. Brown bear.

B. Grizzly.

C. Amaroq.

D. Ursus arctos.

Percent correct = 39.18

15. The most frightening thing about the bear was

A. its eyesight.

B. its strength

C. its paw.

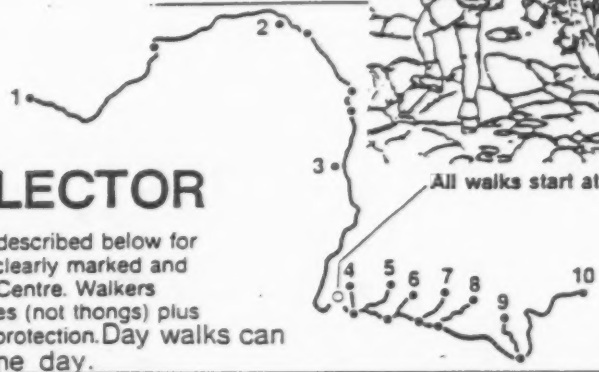
D. its speed.

Percent correct = 49.66

END OF TEST

Stage 7

KATHERINE GORGE WALKING TRACKS



All walks start at Visitor Centre

WALK SELECTOR

Ten different walks are described below for your selection. Each is clearly marked and begins from the Visitor Centre. Walkers should wear sturdy shoes (not thongs) plus a shirt and hat for sun protection. Day walks can be completed in one day.

		NAME OF WALK	ONE WAY DISTANCE (kilometres)	ONE WAY TIME	FEATURES SUMMARY	TRACK CONDITION	COLOUR OF TRACK MARKERS	WATER IS AVAILABLE AT . .
NORTHERN WALKS	CAMPING WALKS**	1 Edith Falls Wilderness	76	5 days	Includes features of walks 2 and 3. Lagoons, swamps, springs plus Edith River and Falls.	Fair	White	14.5 km, 25.5 km 33 km, 55 km and onwards
		2 17 Mile Falls	38	2.5 days	Includes features of walk 3. Crystal Falls (30 m high). Amphitheatre rainforest. Aboriginal paintings plus falls of the 17 Mile Creek.	Fair	White	14.5 km, 25.5 km, 33 km and end
	DAY WALKS	3 Biddlecombe Cascades	14.5	4 hours	Creek and Rockhole. Escarpment with Aboriginal stone arrangement, swamp-fed Cascades.	Good	White	3 km and end
SOUTHERN WALKS		4 Lookout	1.5	1 hour	Views of the picnic area, Katherine River and 17 Mile Valley. Optional return down escarpment to picnic area.	Fair. Last 200 m are rough	Blue	not available
		5 Windolf	4	1.5 hours	Views of lower Gorge and Aboriginal paintings. River swimming.	Good	Yellow	end of walk
		6 Butterfly Gorge	7	2 hours	Shaded gorge with butterflies and rainforest leading into Katherine Gorge.	Fair	Black and White	end of walk
		7 Lily Ponds	10	3 hours	Creekside walk with views of lower Gorge. Lily Ponds swimming.	Fair. Last 500 m are rough	Red and White	end of walk
		8 Smitt's Rock	11	4 hours	Swimming below Dunlop's Swamp and at Smitt's Rock. Gorge views.	Fair. Last 3 km are rough	Silver	8 km and end
	CAMPING WALKS**	9 Djauan Valley	24	2 days	Galleries of Aboriginal paintings. Good views of upper Gorge area.	Fair. Last 4 km are rough	Red	8 km, 22 km and end
		10 Katherine River Wilderness	36	2.5 days	Views of Katherine Valley where River first enters Gorge. Aboriginal paintings. River swimming.	Fair	White	8 km, 31 km and end

**Please note: "Camping Walks" are too long to be completed in one day and walking parties attempting them should comprise at least two people, preferably experienced bushwalkers. Camping permits must be obtained by 3.30 pm from the Visitor Centre before camping on any walks.

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STUDENT QUESTION SHEET

DO NOT MARK THIS SHEET

1. What is the colour of the track markers for the walk to Windolf?

   A. Yellow

   B. Blue

   C. White

   D. Red

Percent correct = 96.36

2. Which is the longest walk?

   A. Edith Falls Wilderness

   B. Djauan Valley

   C. Katherine River Wilderness

   D. 17 Mile Falls

Percent correct = 95.68

3. Which walk takes the least amount of time?

   A. Windolf

   B. Butterfly Gorge

   C. Biddlecombe Gorge

   D. Lookout

Percent correct = 88.18

4. What is the track condition of the walk to Lily Ponds?

   A. good

   B. fair

   C. fair but last 500 m are rough

   D. fair but last 3 km are rough

Percent correct = 88.86

STUDENT QUESTION SHEET

DO NOT MARK THIS SHEET

5. How many day walks are given in the Table?

   A. 3

   B. 6

   C. 8

   D. 10

Percent correct = 61.36

6. What name is given to the walks which are too long to be completed in one day?

   A. Southern Walks

   B. Northern Walks

   C. Day Walks

   D. Camping Walks

Percent correct = 78.86

7. For which walk is water not available?

   A. Windolf

   B. Smitt's Rock

   C. Lookout

   D. Butterfly Gorge

Percent correct = 90.91

8. On which walk are lagoons a feature?

   A. Edith Falls Wilderness

   B. Katherine River Wilderness

   C. 17 Mile Falls

   D. Biddlecombe Cascades

Percent correct = 93.86

STUDENT QUESTION SHEET

DO NOT MARK THIS SHEET

9. What is the purpose of the track markers?

   A. They show walkers which direction to take

   B. They show where water is available

   C. They show the one-way distance

   D. They show how long it takes to reach the end of the walk

Percent correct = 83.86

10. How many of the walks have good track conditions?

   A. 1

   B. 2

   C. 3

   D. 4

Percent correct = 88.86

11. On how many walks will you be able to see Aboriginal paintings?

   A. 2

   B. 3

   C. 4

   D. 5

Percent correct = 70.45

12. By what time must you obtain your camping permit?

   A. 9.00 am

   B. 2.30 pm

   C. 3.30 pm

   D. 5.00 pm

Percent correct = 93.18

STUDENT QUESTION SHEET

DO NOT MARK THIS SHEET

13. At least how many people should there be in a walking party attempting a "Camping Walk"?

A. 1

B. 2

C. 3

D. 4

Percent correct = 86.36

14. On which walk would you not go swimming?

A. Lily Ponds

B. Windolf

C. Lookout

D. Katherine River Wilderness

Percent correct = 88.64

15. What kind of footwear would you take to Katherine Gorge?

A. Thongs

B. Sturdy shoes

C. Sandals

D. High heels

Percent correct = 98.18

END OF TEST

This extract is from *Horizon*, Vol. 2, No. 3, November 1971
Education Department of Western Australia

Iceberg Towing

The idea of towing icebergs from the polar regions to the drier countries of the world is not new. More than twenty years ago an American oceanographer, John Isaacs, brought forward the idea of towing icebergs from the Antarctic regions to the drier centres of the world. At the time many people ridiculed Isaacs, but scientists are now taking the idea seriously.

Isaacs first put forward the idea of iceberg towing during a serious water shortage in southern California in the United States of America. He had been asked to look at the possible ways of transporting huge quantities of water to California from other places. As Isaacs began to study ways of bringing in water by ship, he soon realized that the bigger the ship the cheaper the transport costs would be. It was then that he hit upon the idea of towing an entire iceberg to America.

However, at that time the idea fell through because of many technical difficulties; and it was not until a young scientist called Jonathon Job, from Adelaide University, put forward fresh ideas on iceberg towing that other scientists throughout the world began to study Isaacs' idea again.

Today, it seems quite possible that iceberg towing could become a reality in the future; for scientists, as well as businessmen with an eye to profits, are looking at the idea very closely, and a great deal of money is being poured into studies aimed at overcoming the technical difficulties. Some very wealthy countries in the world, as well as individuals, are interested.

Scientists believe that Australia's likely hunting ground for the icebergs would be north of the Amery ice shelf, near Australia's Davis Antarctic base. This would be the most convenient area from which to tow icebergs to Australia.

Scientists seem to agree that the icebergs would need to be 200–280 metres thick, with a top surface of about five square kilometres. An iceberg of this size would last several months. This would give sufficient time to tow the iceberg the two to three thousand kilometres to Australia.

It has been estimated that a force of about 6 000 tonnes would be needed to move such an iceberg. This would require about 10 to 15 large tugs. A typical towing speed would be around a kilometre per hour, rising to over three kilometres per hour near the end of the journey.

Such a journey would take about two months, during which about half of the iceberg would have melted by the time it reached Australia. Even so, an iceberg of the size mentioned, experts say, would contain enough water on arrival to supply a medium-density city, such as Perth or Adelaide, for about two years.

Though the cost of the venture would be immense, both in labour and power, many believe that iceberg towing would prove less costly in the long run than the alternative of desalination of sea water.

Though some people believe that the transportation of icebergs would have the effect of tampering with the environment, others believe that it would only be taking advantage of the natural drift of ice from the Antarctic to warmer regions.

However, those interested in the idea of towing icebergs still have to overcome many problems. Special studies are being made on the rate that icebergs deteriorate in certain types of weather, and at certain temperatures.

One of the big questions being asked is what effect would the removal of ice have on the polar ice-cap? Scientists say that the total Antarctic iceberg production per year is about 1 200 cubic kilometres. Huge icebergs break from ice shelves and glaciers around the margin of the Antarctic continent and drift north with the tides and winds, gradually melting on the way.

Some people are worried about the effect of the removal of the icebergs from

their natural home regions. They say that their removal may cause parts of the Antarctic areas to warm up, possibly beginning a chain reaction in the environment that nobody yet has sufficient experience to fully understand.

On the other hand, those who support the iceberg towing idea say that the upwelling of the water caused by the removal of icebergs may improve the water by bringing more nutrients to the surface. Also, that it may, in turn, increase the fish population and the number of animals that feed off the fish.

The whole question of iceberg transportation will depend finally on how much it will cost. Although water is a source of life, it is a low-value commodity in most places. Also, for the most part, water from icebergs would probably have to be used reasonably close to its landing position. Although it would be less costly than desalinated sea water, it might be too costly to carry it more than a few hundred kilometres overland. However, iceberg water could be extremely cheap for some countries when compared with desalination, a process which requires much more fuel and much more money.

PRIMARY ASSESSMENT PROGRAM TEST
STAGE 7
STUDENT ANSWER SHEET

STUDENT NUMBER_____CLASS/UNIT_____

SCHOOL CODE_____DATE_____

Iceberg Towing

This article outlines one method that can be used in the future to overcome water shortage in drier parts of the world. It was more than twenty years ago that John Isaacs first suggested the possibility of ..... . He ☐ 1
was originally asked to study ways of ..... to ☐ 2
California to solve the severe ..... there. When his ☐ 3
studies showed that it was more economical to transport ..... of ☐ 4
water in one shipment, Isaacs came up with the idea of using ..... as ☐ 5
a source of water. However, his idea was ridiculed by many people, then finally
abandoned because of ..... . ☐ 6

After a few years some ..... caused scientists to ☐ 7
begin studying the idea of iceberg towing again. Many countries and individuals are
now interested in the idea and are providing ..... for ☐ 8
further research. Businessmen are also now interested in the concept of iceberg
towing as they see it as a way to ..... . ☐ 9

An iceberg large enough to be economical would be only half its original size by the
time it reached its destination, because during ..... it ☐ 10
would gradually ..... . If a smaller iceberg were ☐ 11
used there would not be enough ..... to make the ☐ 12
expensive towing operation worthwhile.

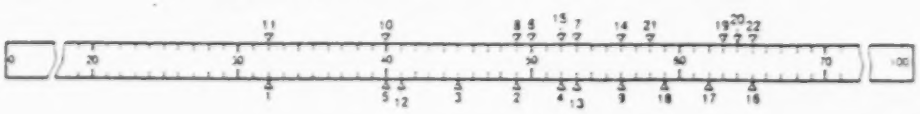
Another possible new source of fresh water is ..... . This is ☐ 13
less likely to be used than icebergs as it would be even ..... . ☐ 14

There are some people who are completely opposed to the idea of iceberg towing
because they believe ..... . Those who support the ☐ 15
scheme claim that the towing of the icebergs would only be making use of
the ..... of icebergs. These supporters also claim ☐ 16
that there is a possibility that it could increase ..... as ☐ 17
the greater water movement would carry ..... to the top. ☐ 18

According to the author, ... is the factor which ☐ 19
will finally determine whether or not iceberg towing becomes a reality. Water, which
is ..... , is scarce in many parts of the world, but ☐ 20
people are still not used to paying much for it.

Even if iceberg towing becomes widely used it is unlikely to solve the water
problems of Australia's dry interior because it would be ..... to ☐ 21
transport it for ..... . ☐ 22

As the population of the world grows, and with it a growing demand for food, the
likelihood of icebergs being used as a source of water increases.



☐ TOTAL

☐ TORCH SCORE

±☐ ERROR